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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,783	06/27/2003	Mike G. MacGregor	884.940US1	6466

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EXAMINER	
BROUSSARD, COREY M	

ART UNIT	PAPER NUMBER
2835	

DATE MAILED: 03/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/607,783	MACGREGOR, MIKE G.	
	Examiner	Art Unit	
	Corey M. Broussard	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 8-11, 13-15, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Nelson et al. (PN 6,046,905). With respect to claim 1, Nelson teaches a heat sink assembly (24) that is coupled to an electronic device (18) and a motherboard (14), the heat sink assembly comprising: a heat sink that includes an opening (holes in 24 for 58, 45, see Fig. 2), a pin (26, 52) extending through the motherboard and the opening in the heat sink to couple the heat sink to the electronic device and the motherboard (col 2 lines 45-46, col 3 lines 27-28, see Fig. 1, 2, 5); and a member (45, 58) within the opening in the heat sink, the member being between the heat sink and the pin (col 3 lines 13-15, 33-35, see Fig. 2).

3. With respect to claim 2, Nelson teaches wherein the member (45, 58) is a bushing that is pressed into the opening in the heat sink (col 3 lines 13-15, 33-35, see Fig. 2).

4. With respect to claim 3, Nelson teaches wherein the pin is pressed through an opening in the bushing (col 3 lines 13-15, 33-35, see Fig. 2).

5. With respect to claim 4, Nelson teaches wherein the member (45, 58) is plastic (col 3 lines 13-15, 33-35).

6. With respect to claim 8, Nelson teaches wherein the pin (26, 52) includes a head (44, 56) that is larger than the opening in the heat sink (see Fig. 2, col 3 lines 15-16, 34-35).

7. With respect to claim 9, Nelson teaches wherein the head (44, 56) of the pin (26, 52) engages the heat sink (24, see Fig. 2).

8. With respect to claim 10, Nelson teaches wherein the pin (26, 52) includes a body that is cylindrical, and the opening in the heat sink is cylindrical (see Fig. 2-5).

9. With respect to claim 11, the method is inherent in the apparatus of Nelson, Nelson teaches thermally coupling a heat sink to an electronic device (col 2 lines 65-67, col 3 lines 1-3); securing the heat sink (24) to a motherboard (14) using a pin (26, 52) that extends through an opening in the heat sink (see Fig. 2); and positioning a member (45, 58) between the pin and the heat sink (col 3 lines 13-15, 33-35, see Fig. 2).

10. With respect to claim 13 and 14, Nelson teaches wherein positioning a member (45, 58) between the pin (26, 52) and the heat sink (24) within the opening in the heat sink includes pressing a bushing into the opening in the heat sink and pressing the pin through an opening in the bushing (col 3 lines 13-15, 33-35, see Fig. 2).

11. With respect to claim 15, Nelson teaches wherein positioning a member (45, 58) between the pin (26, 52) and the heat sink (24) within the opening in the heat sink includes positioning the entire member within the opening in the heat sink (see Fig. 2, 5).

12. With respect to claim 17, Nelson teaches a motherboard (14); an electronic device (18) coupled to the motherboard; a heat sink (24) that includes an opening; a pin (26, 52) extending through the motherboard and the opening in the heat sink to couple the heat sink to the electronic device and the motherboard (col 2 lines 45-46, col 3 lines 27-28, see Fig. 1, 2, 5), and a member (45, 58) within the opening in the heat sink, the member being between the heat sink and the pin (col 3 lines 13-15, 33-35, see Fig. 2).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 5-7, 16, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. (PN 6,046,905) in view of Ruegg (PN 4,266,267). With respect to claims 5 and 6, Nelson teaches the device as applied to claim 1 above but lacks specific teaching where the member has a lower thermal conductivity or a lower modulus of elasticity than the pin and heat sink. Ruegg teaches wherein the member (16, 17) has a lower thermal conductivity and a lower modulus of elasticity than the pin (15) and the heat sink (12, the O ring 16 is made of a resilient and insulating material such as silicone rubber, col 2 lines 63-66, and the plug 17 is made of an insulating material such as Teflon, col 3 lines 2-8, the heat sink is metallic, col 2 line 40, and the pins are machine screws, which are well known to be made of a metallic material. It is

also known that silicone rubber and Teflon materials are much more elastic and have lower thermal conductivity than metallic materials commonly used in heat sink and screws.). It would have been obvious to use the machine screw and resilient insulating member of Ruegg to connect the heat sink and circuit board of Nelson for the benefit of increased electrical insulation between the circuit board and the heat sink.

15. With respect to claim 7, Nelson teaches the device as applied to claim 1 above, but lacks where the member is partially within the opening in the heat sink. Ruegg teaches wherein the member (16, 17) is partially within the opening in the heat sink (12, see Fig. 2, 5, where 17 is L shaped and only partially in the opening of 12). It would have been obvious to person of ordinary skill in the art to use the machine screw and resilient insulating member of Ruegg to connect the heat sink and circuit board of Nelson for the benefit of increased electrical insulation between the circuit board and the heat sink.

16. With respect to claim 16, Nelson teaches the method of claim 11 above, but lacks where the member is more elastic than the pin and heat sink. The method is inherent in the apparatus of Ruegg, Ruegg teaches wherein positioning a member (16, 17) between the pin (15) and the heat sink (12) within the opening in the heat sink includes placing a member that is more elastic (16 is made from a resilient material such as silicone rubber, see col 2 lines 63-66) than the pin and the heat sink between the pin and the heat sink to alleviate stress between the pin and heat sink (the heat sink is made of a metal material, see col 2 line 40, and it is known to use metal machine screws. Silicone rubber is more elastic than metal). It would have been obvious to

combine the elastic member of Ruegg with the heat sink mounting apparatus of Nelson for the benefit of increased electrical insulation between the circuit board and the heat sink.

17. With respect to claim 18 and 19 , Nelson teaches the device as applied to claim 17 above, but lacks wherein the member has a lower thermal conductivity and modulus of elasticity than the pin. Ruegg teaches wherein the member (16, 17) has a lower thermal conductivity and a lower modulus of elasticity than the pin (15, the O ring 16 is made of a resilient and insulating material such as silicone rubber, col 2 lines 63-66, and the plug 17 is made of an insulating material such as Teflon, col 3 lines 2-8, the heat sink is metallic, col 2 line 40, and the pins are machine screws, which are well known to be made of a metallic material. It is also known that silicone rubber and Teflon materials are much more elastic and have lower thermal conductivity than metallic materials commonly used in heat sink and screws.). It would have been obvious to use the machine screw and resilient insulating member of Ruegg to connect the heat sink and circuit board of Nelson for the benefit of increased electrical insulation between the circuit board and the heat sink.

18. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. (PN 6,046,905) in view of Johnson et al (PN 4,321,423). Nelson teaches the method of claim 11 above, but lacks teaching the use of soldering the pin to the motherboard. Johnson teaches wave soldering the pin (9, 10) to the motherboard (8, col 3 lines 50-62). It would have been obvious to use the wave soldering technique

taught by Johnson to connect the pins to the motherboard of Nelson for the benefit of strong electrical and mechanical connection between the pin and the motherboard.

19. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. (PN 6,046,905) in view of Cohen (PN 6,549,410). Nelson teaches the device as applied to claim 17 above, but lacks specific teaching of a chassis attached to the motherboard. Cohen teaches of a motherboard (26) attached to a chassis (24, see Fig. 1). It would have been obvious to a person or ordinary skill in the art to combine the chassis mounted motherboard of Cohen with the heat sink mounting structure of Nelson for the benefit of allowing large and heavy heat sinks offering increased heat dissipation where the weight of the heat sink is not fully supported by the motherboard.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rodseth (PN 4,587,377) and Rodseth et al (PN 4,546,408) demonstrating alternative designs of heat sink assemblies with bushings.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey M. Broussard whose telephone number is 571 272 2799. The examiner can normally be reached on 7:30-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn Feild can be reached on 571 272 2092. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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